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# Research Note

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PRELIMINARY ANNOTATED LIST OF DISEASES OF SHRUBS ON WESTERN GAME RANGES //

2501  
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## ABSTRACT

*Presents a list of diseases of serviceberry (Amelanchier spp.), sagebrush (Artemisia spp.), ceanothus (Ceanothus spp.), mountain mahogany (Cercocarpus spp.), chokecherry (Prunus virginiana), bitterbrush (Purshia tridentata), and willows (Salix spp.). Diseases caused by fungi, bacteria, viruses, and parasitic plants, as well as common physiogenic problems such as winter injury, are included.*

This annotated checklist was compiled to establish a basis for beginning evaluation of the effects of plant diseases on shrubs browsed by big game in Western United States.<sup>2</sup> Included in this list are several of the key shrubs that enhance the carrying capacities of major game winter ranges. Information--unless otherwise cited--was derived from the "Index of Plant Diseases in the United States" (USDA Agr. Res. Serv. 1960), the "Host Fungus Index of the Pacific Northwest" (Shaw 1958), and "Mycoflora-Saximontanensis Exsiccata" (Solheim 1934-1970). Only those organisms known by the author to be pathogenic to browse hosts are included in this list. Where possible, diseases are arranged alphabetically by cause or causal organism; common names such as "damping-off" are used when the cause is not clearly known.

This is intended as a provisional working list of browse plant diseases, and the author invites supplemental information for use in a future more inclusive treatment.

<sup>1</sup>Plant Pathologist, stationed in Logan, Utah 84321, at the Forestry Sciences Laboratory, maintained in cooperation with Utah State University.

<sup>2</sup>Excluding Alaska, Hawaii, and Texas.



Air pollution - highly sensitive to SO<sub>2</sub> and fluoride (Anderson 1966; Carlson & Dewey 1971; and Shaw 1952); a problem only locally in the West.

*Apiosporina collinsii* (Schw.) Hoehn. - witches'-brooms and stem cankers; widespread through Rocky Mountains. Has a *Cladosporium* imperfect stage.

*Cylindrosporium aroniae* Sacc. - leaf spot in Montana and Washington.

Damping-off - considered a problem with seedling survival in a greenhouse (Peterson 1953).

*Erwinia amylovora* (Burr.) Winslow et al. - fireblight, a shoot die-back caused by a bacterium; known in Montana, but possibly widespread throughout the West.

*Erysiphe polygoni* DC. ex Mérat - powdery mildew on leaves and twigs in northern Rocky Mountains.

*Fabraea maculata* Atk. - leaf blight; locally common throughout much of the West. Has an *Entomosporium* imperfect stage.

*Gymnosporangium clavariiforme* (Pers.) DC. - rust of leaves, fruits, and sometimes twigs. Common in Rocky Mountains.

*G. clavipes* (Cke. & Pk.) Cke. & Pk. - rust of fruits and twigs; local in northern Rocky Mountains.

*G. cupressi* Long & Goodding - rust of leaves; local in California (Peterson 1968) and Arizona.

*G. harknessianum* Kern ex Arth. - rust chiefly on fruits and stems; in Cascades and Sierra Nevada Mountains.

*G. inconspicuum* Kern - rust chiefly on fruits; common, especially in Great Basin (Peterson 1967) and southeastward to New Mexico and Arizona.

*G. kernianum* Bethel - rust of fruits and leaves; common from Arizona and New Mexico to Idaho and Oregon (Peterson 1967).

*G. libocedri* (P. Henn.) Kern - rust of leaves and fruits; common to abundant in Cascades and northern Sierra Nevada.

*G. nelsonii* Arth. - rust of leaves and fruits; common throughout Rocky Mountains.

*G. nidus-avis* Thaxt. - rust of leaves, stems, and fruits; common to abundant in Rocky Mountains.

*Lophodermium hysterioides* (Pers.) Sacc. - leaf spot in northern Rocky Mountains.

*Nectria cinnabarina* Tode ex Fr. - stem canker in Idaho and Oregon.

*Phyllactinia guttata* (Fr.) Lévl. - powdery mildew of foliage in Colorado and Washington.

*Phyllosticta innumerabilis* Pk. - leaf spot in Montana and North Dakota.

*Sclerotinia gregaria* Dana - leaf and fruit blight; local in Washington and Colorado.

*Taphrina amelanchieri* Mix. - witches'-broom; in California.

*Tympanis amelanchieris* Groves - on twigs in Idaho.

### ARTEMISIA<sup>3</sup>

*Cylindrosporium artemisiae* Dearn. & Barth. - leaf spot in Washington.

*Erysiphe cichoracearum* DC. ex Mérat - powdery mildew of foliage; widespread in the West.

*Fomes annosus* (Fr.) Cke. - root rot of big sagebrush in California (Smith, Bega, and Tarry 1966).

*Phyllosticta rauli* (Pk.) Dearn. & House - leaf spot in northern Rocky Mountains.

<sup>3</sup>Disease list refers only to species of *Artemisia* that are woody shrubs.



*Puccinia atrofusca* (Dudl. & Thomp.) Holw. - leaf rust; common on many sagebrush species in the West.

*P. millefolii* Fckl. - leaf rust; occurs on some of the semishrubby sagebrushes in the West.

*P. tanacetii* DC. - leaf rust; the most common rust on many species of sagebrush including big sagebrush.

*Sclerotium* sp. - stem blight in Oregon.

*Septoria artemisiae* Pass. - leaf spot in Washington.

*Syncarpella tumefaciens* (Ell. & Harkn.) Th. & Syd. - black knot stem gall in inland West.

*Uromyces oblongisporus* Ell. & Ev. - leaf rust known locally in Wyoming on big sagebrush.

#### CEANOETHUS

*Agrobacterium tumefaciens* (E. F. Sm. & Town.) Conn - bacterial crown gall in Washington.

*Armillaria mellea* (Vahl ex Fr.) Qué. - root rot induced dieback; widespread in Inland Empire (Tarry and Shaw 1966) and California.

*Cercospora ceanothi* Kell. & Swing. - leaf spot in Kansas.

*Cylindrosporium ceanothi* Ell. & Ev. - leaf spot in Pacific Coast States.

Damping-off - a common seedling disease (Peterson 1953; USDA Forest Serv. 1948).

*Eutypa armeniaca* Hansf. & Carter - top dieback in ornamental wild lilacs in California. Has a *Cytosporina* imperfect stage (Moller, Ramos, and Hildreth 1971).

*Microsphaera penicillata* (Wallr. ex Fr.) Lé. - powdery mildew of foliage in Idaho and Washington.

*Puccinia tripsaci* Diet. & Holw. - leaf rust in Plains States. Also found on Gramineae alternate hosts west to New Mexico.

*Septoria ceanothi* Dearn. - leaf spot in Idaho.

Winter injury - foliage dieback, periodically widespread in inland West.

#### CERCOCARPUS

Damping-off, - heavy seedling losses may occur on alkaline soils (USDA Forest Serv. 1948).

*Fomes annosus* (Fr.) Cke. - root rot in northeastern California (Tegethoff<sup>4</sup>).

*Gloeosporium cercocarpi* Ell. & Ev. - leaf spot in California.

*Septogloeum cercocarpi* Bonar - leaf spot in California. A somewhat similar leaf spot from Nevada to Washington is under study at the Forestry Sciences Laboratory, Logan, Utah, and awaiting positive identification.

*Sphaceloma cercocarpi* Bitan. and Jenkins - leaf anthracnose in California.

#### PRUNUS VIRGINIANA L.

Air pollution - of intermediate sensitivity to SO<sub>2</sub> and fluoride (Anderson 1966; Carlson and Dewey 1971; and Shaw 1952); a local problem in the West.

*Cercospora circumscissa* Sacc. - leaf spot from Montana to Kansas.

*Coccomyces lutescens* Higgins - shot-hole leaf spot; general throughout the West.

*Cylindrosporium nuttallii* (Harkn.) Dearn. - leaf spot in Oregon.

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<sup>4</sup>Personal communication from A. C. Tegethoff, Plant Pathologist, USDA Forest Serv., R-4, Ogden, Utah.







Damping-off - apparent resistance was high in a greenhouse test in loam soil (Peterson 1953).

*Dibotryon morbosum* (Schw.) Th. & Syd. - black knot canker; general and abundant in the West. Has a *Cladosporium* imperfect stage.

*Eutypa armeniaca* Hansf. & Carter - a canker disease in California (English and Davis 1965). Has an imperfect stage of *Cytosporina*, and is an important dieback disease of apricot.

*Lophodermium prunicola* Tehon - tar spot of leaves in Colorado.

*Mycosphaerella cerasella* Aderh. - leaf spot in Kansas.

*Nectria cinnabarina* Tode ex Fr. - stem canker; widespread in the West.

*Phyllactinia guttata* (Fr.) Lév.<sup>5</sup> - powdery mildew in Washington.

*Phyllosticta circumscissa* Cke. - leaf spot in Kansas and Washington.

*P. virginiana* (Ell. & Halst.) Ell. & Ev. - leaf blotch in Kansas and Montana.

*Podosphaera clandestina* (Wallr. ex Fr.) Lév. - powdery mildew of foliage in northern Rocky Mountains.

*Sclerotinia demissa* Dana - shoot and fruit blight; widespread in Rocky Mountains.

*Taphrina confusa* (Atk.) Gies. - causes hypertrophy of leaves, fruits, and young stems. Widespread in the West.

*Tranzschelia pruni-spinosae* (Pers.) Diet. - leaf rust in Nebraska, and known west to California on Ranunculaceae alternate hosts (Arthur 1934).

Twisted leaf virus disease of cherry - chokecherry is a symptomless carrier of this virus at the border between north-central Washington and British Columbia (Lott and Keane 1960).

*Valsa* spp. and their imperfect stage *Cytospora* - on twigs possibly as canker diseases from Washington to Kansas.

Western X-disease virus - widespread in Rocky Mountains and Pacific Northwest and of major importance to stone fruit industry (Reeves and others 1951). A mycoplasma may be involved in inciting this disease (Huang and Nyland 1970).

#### *PURSHIA TRIDENTATA* (PURSH) DC.

*Armillaria mellea* (Vahl ex Fr.) Quél. - root rot in central Idaho, northern California, and possibly southern Oregon (Kimmey<sup>5</sup>).

*Cuscuta* sp. - dodder; a parasitic plant on bitterbrush seedlings in southern Idaho (Tegethoff<sup>6</sup>).

Damping-off - a common problem in establishing bitterbrush plants from seeds in the West (Brown and Martinsen 1959; Holmgren 1956; and Peterson 1953). *Rhizoctonia solani* Kühn and *Pythium ultimum* Trow. have been shown experimentally to cause damping-off in bitterbrush (Nord 1965).

Dieback - bitterbrush is declining on 30,000 acres in northeastern California and adjacent Oregon from an unknown cause (Calif. Forest Pest Control Action Council 1970).

*Diplodia* sp. - associated with a root-stem canker in northeastern California (Nord 1965). Also see *Fusarium* sp.

Drought - in 1934, a drought seriously set back natural stands of bitterbrush in southeastern Idaho (Pechanec, Pickford, and Stewart 1937).

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<sup>5</sup>Personal communication with Dr. J. W. Kimmey, retired Plant Pathologist, USDA Forest Service, now in Westport, Washington.

<sup>6</sup>See footnote 4.



*Fomes annosus* (Fr.) Cke. - root rot in Idaho (specimen K-868 at Logan FSL).  
Frost injury - a spring frost in 1964 caused extensive dieback over about 22,000 acres in eastern California (Smith, Scharpf, and Schneegas 1965).  
*Fusarium* sp. - isolated at Logan FSL from roots of dying bitterbrush from an Idaho planting area. *Fusarium* sp. was also associated with the *Diplodia* sp. of the root-stem canker described by Nord (1965).

#### SALIX

Air pollution - willows in Pacific Northwest are fairly sensitive to SO<sub>2</sub> (Shaw 1952).  
*Armillaria mellea* (Vahl ex Fr.) Quél. - root rot in California and Washington.  
*Ascochyta salicis* Bonar - leaf spot in California.  
Black Hills mortality - cause not clarified, possibly several contributing factors (Froiland 1962).  
*Ciborinia foliicola* (Cash and Davidson) Whetzel - Black rib disease on leaves in Colorado (Davidson and Cash 1933).  
*Cryptodiaporthe salicina* (Curr.) Wehm. - twig and branch canker in Great Plains and Pacific Coast States. Has an imperfect stage of *Discella carbonacea* (Fr.) Berk. & Br.  
*Cryptomyces maximus* (Fr.) Rehm. - bark blister canker in New Mexico, Utah, and Wyoming (specimen K-871 at Logan FSL).  
*Cryptosporium* sp. - branch canker in California.  
*Cuscuta* sp. - dodder (a flowering plant) parasitizes willow in Utah and Washington.  
*Cylindrosporium salicinum* (Pk.) Dearn. - leaf spot in Colorado and Pacific Northwest.  
*Dothiora polyspora* Shear and Davidson - twig canker and dieback in Colorado.  
*Dothiorella gregaria* Sacc. - black canker in California.  
*Dothiorella* sp. - canker in North Dakota.  
*Gloeosporium boreale* Ell. & Ev. - leaf spot in Wyoming and Arizona.  
*Helicotylenchus anhelicus* Sher. - root nematode in California (Ruehle 1967).  
*Hemicyclophora hesperis* Raski - root nematode in California (Ruehle 1967).  
Herbicides - willows are quite sensitive (Lyon and Mueggler 1968; and Ryker 1970).  
*Marssonina apicalis* (Ell. & Ev.) Magn. - leaf spot in California and Wyoming.  
*M. kriegeana* (Bres.) Magn. - leaf spot in California and Wyoming.  
*M. rubiginosa* (Ell. & Ev.) Magn. - leaf spot in Idaho.  
*M.* sp. - leaf and twig blight in Pacific Northwest.  
*Melampsora epitea* Thuem. - rust; abundant on foliage of willows throughout the West.  
*M. paradoxa* Diet. & Holw. - rust; abundant on foliage of willows throughout the West.  
*Melanconium* sp. - twig canker in Colorado.  
*Meloidogyne* sp. - root knot nematode in Arizona (Ruehle 1967).  
*Neotria* spp. - canker of stems in New Mexico and Pacific Northwest.  
*Ocellaria ocellata* (Pers. ex Fr.) Schroet. - stem canker in Colorado and North Dakota.



*Phomopsis salicina* (West.) Died. - twig canker in Washington.

*Phoradendron* spp. - mistletoes are common parasites on stems of willows in the Southwest.

*Phyllactinia guttata* (Fr.) Lév. - Powdery mildew of foliage in Washington.

*Phyllosticta apicalis* J. J. Davis - leaf spot in Great Plains.

*P. salicicola* Thuem. - leaf spot in Idaho.

*P. salicis* Kell. & Swingle - leaf spot in Kansas.

*Pratylenchus vulnus* Allen & Jensen - root nematode in California (Ruehle 1967).

*Pseudopeziza salicis* (Tul.) Poteb. - leaf spot and twig blight in Oregon and Washington; has an imperfect stage of *Gloeosporium salicis* West.

*Ramularia rosea* (Fckl.) Sacc. - leaf spot in Rocky Mountains.

*Rhytisma salicinum* (Pers.) Fr. - tar spot on leaves; common in Great Plains, Rocky Mountains, and Pacific Northwest.

*Sclerophoma salicis* Died. - twig blight in California.

*Septogloeum maculans* Harkn. - leaf spot in California and Montana.

*S. salicis-fendlerianae* Dearn. & Barth. - leaf spot in Rocky Mountains.

*Septoria salicicola* (Fr.) Sacc. - leaf spot in Oregon.

*S. sp.* - leaf spot in Idaho and Oregon.

*Sphaceloma murrayae* Jenkins and Grodsinsky - gray scab of foliage in Pacific Coast States.

*Taphrina populi-salicis* Mix - yellow leaf blister in California.

*Trichodorus californicus* Allen - root nematode in California (Ruehle 1967).

*Uncinula salicis* (DC. ex Mérat) Wint. - powdery mildew of foliage; common throughout the West.

*Valsa* spp. - twig and branch canker with *Cytospora* imperfect stage. Common throughout the West.



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